CURRENT PRACTICE OF ENVIRONMENTAL CHARACTERIZATION AND MONITORING TECHNOLOGIES

TECHNOLOGY NEED

The 1994 National Research Council (NRC) report, "Ranking Hazardous Waste Sites for Remediation," states that hazardous waste remediation costs could surpass one trillion dollars in the United States when the federal and state government costs are combined with private sector costs. The DOE, EPA, and DoD are the three major agencies responsible for cleanup of hazardous waste sites. As cited in the same report, the total cost of the Superfund alone is estimated to become between $100 and $500 billion as new sites are added to the list during the next 30 to 50 years. A more recent base-case cost estimate for the cleanup of DOE sites is $227 billion. According to the NRC report, the cleanup cost for DoD could amount to "several hundreds of billions of dollars." Significant savings in cleanup costs can be achieved through knowledge of the extent of contamination at these waste sites and improved efficiencies in waste treatment processes.

In view of the importance of environmental characterization and monitoring technologies in reducing overall cleanup costs, the DOE, EPA, and DoD continue to invest significantly in their development. Although the EPA and DOE have developed many new technologies, only a limited number are in use at waste sites. One of the barriers cited for not using the new technologies is the lack of documentation on their cost and performance advantages over the baseline technologies. Even those technologies that have been successfully implemented are being used in a limited manner at isolated sites instead of being widely used.

TECHNOLOGY DESCRIPTION

This study is to document current practices of environmental technologies in the areas of site characterization and remediation process monitoring. This activity will collect, assess, and compile information from technology users and purchasers involved in DOE environmental management programs. Key information in the survey includes the technology and instrumentation used, its vendor, unit and capital equipment costs, targeted problems (contaminants/media/geologic settings), use of data in site assessment and remedial activities, data quality, analysis turnaround times, number of samples analyzed and total costs incurred annually, and performance parameters (ease of operation, portability, sensitivity, reduced cost and analysis time, etc.) valued by the users for improvement.

FY 1998 activities will include updating information in the hardcopy publication, converting the document into a database format, developing a database search function, and adding technologies used in other federal programs (i.e., the EPA, DoD, DOC, and DOI) as well as at private company sites. Beginning in FY 1999, an annual update will be performed via interactive exchanges on the Internet, nominal administering and reviewing activities are expected. The interactive feature and mechanism for review of information will be developed in FY 1998.

BENEFITS

There are many purposes for documenting the current practices of environmental characterization and monitoring technologies:

- To provide baseline cost and performance information about currently practiced technologies.
- To aid in marketing the use of new technologies by quantifying cost and performance advantages over current practices.
- To compare current practices at different waste sites.
- To provide technology users and purchasers with information about new technologies being used at other sites.
- To identify the ineffectiveness of current practices.

- To provide information for use in evaluating the merits of new proposals for funding.
- To focus technology development on activities with high cost-savings impact.
- To supplement information in the “Characterization Preferred Alternatives Matrix” document.

CAPABILITIES AND LIMITATIONS

This practical, time-efficient, Internet-based survey form allows easy access, 24 hours a day. Technology end-users and managers could access a single hub for information on environmental measurement and monitoring technologies. Data analysis capabilities are planned for development in FY 1998. The primary limitation is awareness of the database availability for input and information.

COLLABORATION/TECHNOLOGY TRANSFER

The Institute for Crustal Studies at the University of California, Santa Barbara (UCSB) with, in particular, its expertise in geohydrological and geophysical aspects of the study, assisted in the development of the initial survey. A panel of experts and DOE managers from analytical management and performance evaluation programs also assisted in the survey development. Collaboration continues with the Environmental Studies Program at the University of California, Santa Barbara.

ACCOMPLISHMENTS

A report, “Survey of Current Practice of Environmental Characterization and Monitoring Techniques: Selected Department of Energy (DOE) Sites,” was completed and placed on the CMST team Internet site in September 1997. An Internet-based survey was developed in March 1998.

TECHNICAL TASK PLAN (TTP) INFORMATION

TTP No./Title: NV07C264 - Current Practice of Environmental Characterization and Monitoring Technologies

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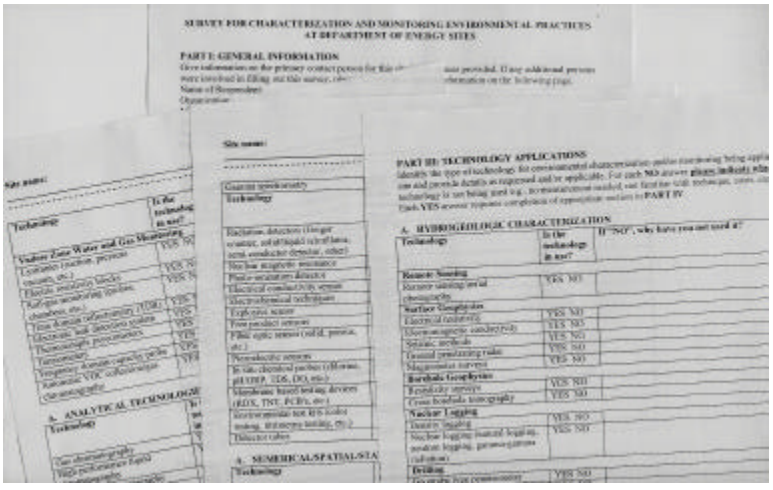
SURVEY FOR CHARACTERIZATION AND MONITORING ENVIRONMENTAL PRACTICES AT DEPARTMENT OF ENERGY SITES

PART I: GENERAL INFORMATION

PART III: TECHNOLOGY APPLICATIONS

A comprehensive Internet based survey form is used to collect detailed information on the current practices of environmental site characterization and monitoring technologies in use by DOE, DoD, and EPA. The information collected provides site managers with cost and performance information and keeps them informed about new and alternative practices and technologies.